

IN THE CLAIMS

Please amend the claims as follows.

1-2. (Canceled)

3. (Previously Presented) A computer-implemented method comprising:

- identifying a candidate reuse region;
- determining an input set for the candidate reuse region, wherein the input set comprises a plurality of input registers;
- instrumenting the software to profile set-values for the input set, wherein each set-value comprises an input register value for each of the plurality of input registers;
- for each set-value, combining each of the input register values into a single value; and
- executing the instrumented software.

C/ 4. (Original) The computer-implemented method of claim 3 wherein combining comprises:

- folding each of the input register values to create folded values; and
- concatenating the folded values.

5. (Previously Presented) The computer-implemented method of claim 3 wherein instrumenting comprises inserting instructions to periodically sample set-values.

6. (Original) The computer-implemented method of claim 5 wherein the input-set comprises a plurality of input registers, and each set-value comprises an input register value for each of the plurality of input registers, and wherein instrumenting further comprises:

- inserting instructions to combine each of the input register values into a single value; and
- inserting instructions to index into a data structure of profile indicators using the single value.

7. (Original) The computer implemented method of claim 5 wherein instrumenting further comprises:

inserting instructions to profile the top N occurring set-values, where N is chosen as a function of an expected number of reuse instances.

8. (Previously Presented) The computer-implemented method of claim 3 further comprising selecting the candidate reuse region as a computation reuse region.

9. (Previously Presented) A machine readable medium including instructions for a method of profiling software, the method comprising:

identifying a candidate reuse region;

determining an input set for the candidate reuse region, wherein the input set comprises a plurality of input registers;

instrumenting the software to profile set-values for the input set, wherein each set-value comprises an input register value for each of the plurality of input registers; for each set-value, combining each of the input register values into a single value; and

executing the instrumented software.

10. (Original) The machine readable medium of claim 9 wherein instrumenting comprises:

inserting instructions to periodically sample set-values.

11. (Previously Presented) A computer-implemented method comprising:

periodically sampling a set of registers to obtain register values;

determining an occurrence frequency of the register values;

combining the register values into a single set-value; and

storing the occurrence frequency and the single set-value in a data structure.

12. (Original) The computer-implemented method of claim 11 wherein periodically sampling comprises:

sampling a plurality of registers to obtain a set-value every S occurrences of a candidate reuse region, where S is a sampling period.

13. (Original) The computer-implemented method of claim 12 further comprising:

identifying a group of control equivalent candidate region entries and candidate load instructions;

inserting instructions prior to the group, wherein the instructions set a predicate register every S occurrences; and

inserting profiling instructions at each of the control equivalent candidate region entries and candidate load instructions, wherein the profiling instructions are predicated on the predicate register.

CA 14. (Original) The computer-implemented method of claim 12 wherein storing comprises:

accessing a record in the data structure as a function of the set-value; and

incrementing a profile indicator at the record.

15. (Original) The computer-implemented method of claim 12 wherein periodically sampling further comprises sampling set-values in the plurality of registers at the beginning of a candidate reuse region, the plurality of registers being input registers to the candidate reuse region.

16. (Previously Presented) A computer-implemented method comprising:

identifying a candidate load instruction;

instrumenting the software to sample a location-value every S occurrences of the candidate load instruction;

storing an occurrence frequency of the location-values into a data structure; and

executing the software.

17. (Original) The computer-implemented method of claim 16 wherein instrumenting comprises:

inserting instructions in the software to count the number of times each location-value is sampled; and

inserting instructions in the software to keep track of top location-values.

18. (Original) The computer-implemented method of claim 16 further comprising:

identifying a group of control equivalent candidate region entries and candidate load instructions;

inserting instructions prior to the group, wherein the instructions set a predicate register every S occurrences; and

inserting profiling instructions at each of the control equivalent candidate region entries and candidate load instructions, wherein the profiling instructions are predicated on the predicated register.

19. (Original) The computer-implemented method of claim 17 wherein the candidate region includes a plurality of candidate load instructions, each of the plurality of load instructions being predicated on a common predicate register.

20. (Original) The computer-implemented method of claim 17 wherein inserting instructions to keep track of top location-values includes inserting sampling instructions configured to profile the top N occurrences of location-values, where N is an integer.

21. (Original) A machine readable medium including instructions for a method of profiling software, the method comprising:

identifying a candidate load instruction;

instrumenting the software to sample a location-value every S occurrences of the candidate load instruction; and

executing the software.

22. (Original) The machine readable medium of claim 21 wherein instrumenting comprises inserting instructions in the software to count the number of times each location-value is encountered.

23. (Previously Presented) A computer-implemented method comprising:
selecting reuse regions within a software program, the selecting including,
profiling top set-values for candidate reuse regions to produce a probability of top set-values; storing an occurrence frequency of the location-values into a data structure;
and
selecting reuse regions as a function of the probability of top set-values.

24. (Original) The computer-implemented method of claim 23 wherein profiling set-values comprises:
representing each top set-value as a single value; and
accessing a data structure as a function of the single value to modify a profile indicator.

25. (Original) The computer-implemented method of claim 24 wherein accessing a data structure comprises accessing a data structure at least as large as a number of expected reuse instances.

26. (Original) The computer-implemented method of claim 25 wherein selecting comprises marking as reuse regions those candidate reuse regions having a finite number of top set-values that have a probability of occurrence greater than a threshold.

27. (Original) A machine readable medium including instructions for a method of selecting reuse regions within a software program, the method comprising:
profiling top set-values for candidate reuse regions to produce a probability of top set-values; and
selecting reuse regions as a function of the probability of top set-values.

28. (Original) The machine readable medium of claim 27 wherein profiling set-values comprises:

- representing each top set-value as a single value; and
- accessing a data structure as a function of the single value to modify a profile indicator.

29. (Previously Presented) The machine-readable medium of claim 27 further comprising:

- identifying a candidate load instruction within the candidate reuse region; and
- instrumenting the software to profile location-values for the candidate load instruction.

30. (Previously Presented) A computer-implemented method comprising:

- identifying a candidate reuse region;
- determining an input set for the candidate reuse region, wherein the input set comprises a plurality of input registers;
- instrumenting the software to profile set-values for the input set, wherein each set-value comprises an input register value for each of the plurality of input registers, wherein instrumenting further includes,
 - inserting instructions to combine each of the input register values into a single value; and
 - executing the instrumented software.

31. (Previously Presented) The computer-implemented method of claim 30 further comprising:

- inserting instructions to index a data structure of profile indicators using the single value.

32. (Previously Presented) The computer-implemented method of claim 30, wherein combining the register values into a single set-value is performed using an exclusive-or operation.

33. (New) A computer-implemented method comprising:

sampling a plurality of registers to obtain one of a number of top set-values, wherein the sampling occurs every S occurrences of a candidate reuse region, where S is a sampling period, and wherein S is a multiple of the number of top set-values; determining an occurrence frequency of the register values; combining the register values into a single set-value; and storing the occurrence frequency and the single set-value in a data structure.

34. (New) The computer-implemented method of claim 33 further comprising:

identifying a group of control equivalent candidate region entries and candidate load instructions;

inserting instructions prior to the group, wherein the instructions set a predicate register every S occurrences; and

inserting profiling instructions at each of the control equivalent candidate region entries and candidate load instructions, wherein the profiling instructions are predicated on the predicate register.

35. (New) The computer-implemented method of claim 33, wherein storing comprises:

accessing a record in the data structure as a function of the single set-value; and incrementing a profile indicator.
